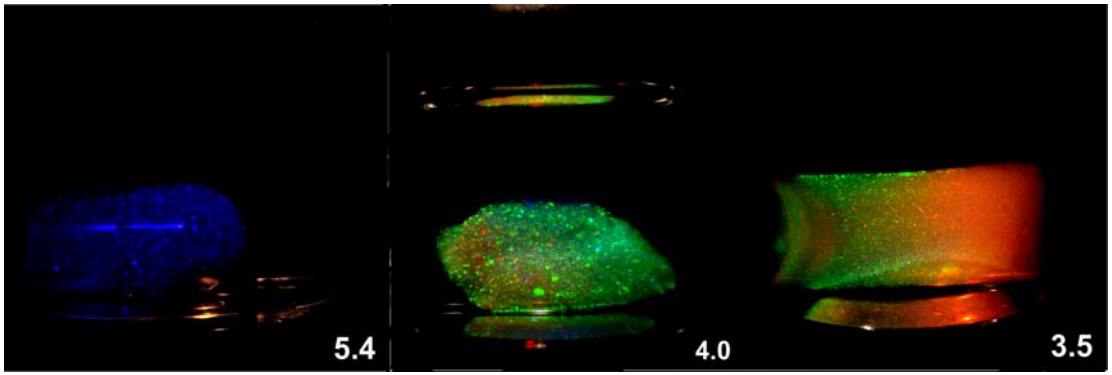
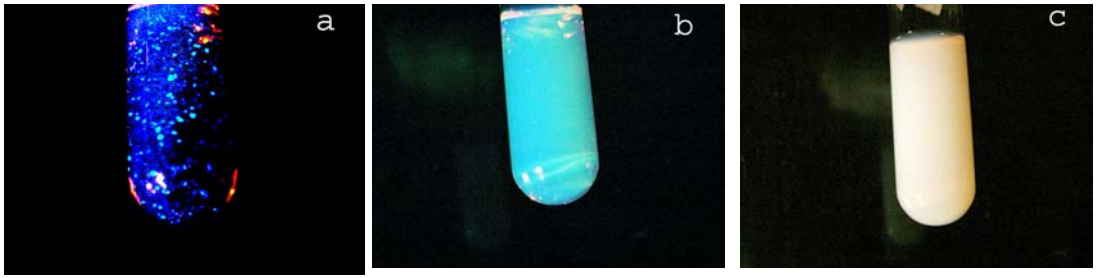
Synthesis and study of covalently bonded self-assembled polymer gel nanoparticles

Zhibing Hu, University of North Texas, DMR-0102468



Left panel: Crystalline hydrogels with high polymer concentrations from 5.4 to 3.5 wt% were synthesized.

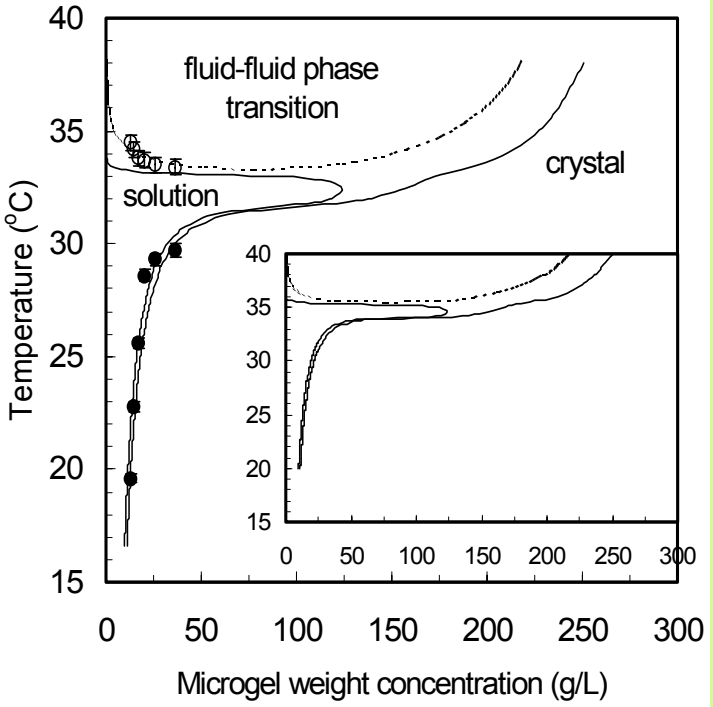
Z. B. Hu and G. Huang, "A new route to crystalline hydrogels as guided by a phase diagram," *Angew. Chem. Int. Ed*. **42**, 4799 (2003).



Top panel: Microgel dispersion with polymer concentration of 16.9 g/L at: (a) 21°C, (b) 26°C, and (c) 35°C.

Right panel: The phase diagram of a microgel dispersion determined from turbidity measurements (symbols) and from the thermodynamic perturbation theory (lines).

J. Z. Wu, B. Zhou, and Z. B. Hu, "Phase behavior of thermally responsive microgel colloids," *Phys. Rev. Lett*. **90**, 048304 (2003).



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Broader Aspects of Research Accomplishment

- Dr. X. H. Xia received Ph.D. in Chemistry (2003). The title of his dissertation is "Fabrication and light scattering study of multi-responsive nanostructured hydrogels and water-soluble polymers"
- Four students of the Texas Science and Mathematic Academy (TAMS) at UNT have participated this project. Ms. Jessica Yih has been selected as a semifinalist in the 2003 Intel Science Talent Search. Her research topic was on nanostructured hydrogels.
- Mr. Ryan Bosca, an undergraduate sponsored by NSF's REU program, worked on gel nanoparticle project under PI's supervision in summer 2003.
- The PI has made physics demonstrations for undergraduate students, pre-college teachers, young people, and other non-scientist members of the public.